

**Vita**  
**J. Gregory Trafton**

**Mailing Address:**

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**Education:**

Princeton University, 1989–1994. Ph.D in Psychology, June 1994.  
Princeton University, 1989–1991. M.A. in Psychology, 1991.  
Trinity University, 1985–1989. B.S. in Computer Science; second major in Psychology, 1989.

**Positions Held:**

2006–present: Section head for the Intelligent Systems Section for the Naval Research Laboratory  
1995–2006: Engineering Research Psychologist for the Naval Research Laboratory  
1995–present: Affiliate/Adjunct Professor at George Mason University (Every Wednesday I run a reading group, meet with students, etc.)  
1993–1994: Research Scientist for NTI, Inc., Brooks Air Force Base  
1989–1993: Major advisors: Brian J. Reiser and Phil N. Johnson-Laird, Department of Psychology, Princeton University.

**Research Interests:**

Computational Cognitive Modeling, Human-Robot Interaction, Interruptions and Resumptions, Graph Comprehension (including scientific visualization)

### **Research Methods:**

Computational Cognitive Modeling (primarily within ACT-R),  
Protocol analysis, Eye-tracking, Gesture analysis, Traditional  
psychological experimentation

### **Teaching Experience:**

Scientific Visualization (GMU)  
An Introduction to Cognitive Science (GMU)  
Learning Environments and HCI (GMU)

### **Funding**

Agent-Based Architectures. Office of Naval Research. 600K over  
3 years (1997-1999). Aha, D., Ballas, J., & Trafton, J. G.

Improved Human System Process for METOC. Office of Naval  
Research. 60K. (1999). Ballas, J., & Trafton, J. G.

Spatial Transformations. Office of Naval Research. 31K (1999).  
Trafton, J. G.

Language Understanding for Interactive Knowledge Management  
Naval Research Laboratory/Office of Naval Research. 550K  
over 2 years (1999-2000). Marsh, E., & Trafton, J. G.

Human Centered Scientific Visualization. Naval Research Laboratory/Office of Naval Research. 900K over 4 years (2000-  
2003). Trafton, J. G.

Learning new knowledge structures in a cognitive model. Office  
of Naval Research. 480K over 3 years (2000-2002). Schultz,  
A. C., & Trafton, J. G.

METOC Human-System Interaction Improvement. Office of Naval  
Research. 200K over 5 years (2000-2004). Ballas, J., & Trafton,  
J. G.

Managing Attention in Critical Event Systems. Office of Naval  
Research. 250K (2000). Schmidt-Nielsen, A., Ballas, J., &  
Trafton, J. G.

- Managing Attention in Critical Event Systems. Office of Naval Research. 125K (2001). Trafton, J. G., & Ballas, J.
- Managing Attention in Critical Event Systems. Office of Naval Research. 750K (2002-2004). Trafton, J. G., & Ballas, J.
- Environmental Visualization. Office of Naval Research. 1.5 M over 5 years (2002-2007). Ballas, J., & Trafton, J. G.
- Mixed initiative control. DARPA MARS 2010 Program. 250K (2003-2004). Schultz, A. C. & Trafton, J. G.
- Control of hybrid embodied agents. DARPA COABS Program. 100K (2002-2003). Schultz, A. C. & Trafton, J. G.
- Complex problem solving with certain representations of an uncertain world. Office of Naval Research. 92K (2003-2005). Trafton, J. G. (with C. Schunn and S. Kirschenbaum funded under separate grants).
- Reducing the disruptive effects of interruptions in complex systems. Office of Naval Research. 525K (2004-2007). Trafton, J. G.
- Coping with Information Uncertainty. 400K (2004-2008). Office of Naval Research. Trafton, J. G.
- Clutter in Complex Visualizations. 15K (2005). Office of Naval Research. Trafton, J. G.
- Clutter in Complex Visualizations. 50K (2006). Office of Naval Research. Trafton, J. G.
- Complex problem solving with certain representations of an uncertain world. Office of Naval Research. 280K (2006-2008). Trafton, J. G. (with C. Schunn and S. Kirschenbaum funded under separate grants).
- Hybrid Cognitive / Reactive Mechanisms as Reasoning Modules for Collaborative Autonomous Systems . 450K (2006-2008). Office of Naval Research. Schultz, A. and Trafton, J. G.
- Multimodal interfaces for high-level human-robot collaborations. 450K (2006-2008). Office of Naval Research. Schultz, A. and Trafton, J. G.

- Computational Cognitive Models of Visualization Comprehension. 80K (2006). Office of Naval Research. Trafton, J. G.
- Clutter in Complex Visualizations. 50K (2007). Office of Naval Research. Trafton, J. G.
- Understanding color to improve performance. 780K (2007-2009). Office of Naval Research. Trafton, J. G.
- Robots modeling teammates for better teamwork. 300K (2007-2009). Office of Naval Research. Trafton, J. G.

### **Journal Articles:**

- Altmann, E. M. & Trafton, J. G. (in press). Timecourse of Recovery from Task Interruption: Data and a Model. *Psychonomics Bulletin and Review*.
- Trickett, S. B. & Trafton, J. G. (in press). "What if...": The Use of Conceptual Simulations in Scientific Reasoning *Cognitive Science*.
- Kennedy, W. G., Trafton, J. G. (in press). Long-term symbolic learning in Soar and ACT-R. *Cognitive Systems Research*.
- Trafton, J. G., Trickett, S. B., Stitzlein, C. A., Saner, L., Schunn, C. D., & Kirschenbaum, S. S. (2006). The relationship between Spatial Transformations and Iconic Gestures *Spatial Cognition and Computation*. 6(1), 1-29. [Lead Article]
- Trafton, J. G., Trickett, S. B., & Mintz, F. E. (2005). Connecting internal and external representations: Spatial transformations of scientific visualizations. *Foundations of Science*. 10(1), 89-106.
- Bogacz, S., & Trafton, J. G. (2005). Understanding Dynamic and Static displays: Using Images to Reason Dynamically. *Cognitive Systems Research*. 6(4), 312-319.
- Sofge, D., Bugajska, M., Trafton, J. G., Perzanowski D., Thomas S., Skubic M., Blisard S., Cassimatis N., Brock D., Adams W, Schultz A. (2005). Collaborating with Humanoid Robots

- in Space. *International Journal of Humanoid Robotics*. 2(2), 181-201.
- Trafton, J. G., Cassimatis, N. L., Bugajska, M. D., Brock, D. P., Mintz, F. E., & Schultz, A. C. (2005). Enabling effective human-robot interaction using perspective-taking in robots. *IEEE Transactions on Systems, Man, and Cybernetics—Part A: Systems and Humans*. 35(4), 460-470.
- Schultz, A. C., & Trafton, J. G. (2005). Towards collaboration with robots in shared space: Spatial perspective and frames of reference. *Interactions*. Xii.2 (March-April), 22-24.
- Cassimatis, N. L., Trafton, J., G., Bugajska, M. D., & Schultz, A. C. (2004). Integrating Cognition, Perception and Action through Mental Simulation in Robots. *Journal of Robotics and Autonomous Systems*. 49(1-2), 13-23.
- Monk, C., Boehm-Davis, D. A., & Trafton, J. G. (2004). Recovering from Interruptions: Implications for Driver Distraction Research. *Human Factors*. 46(4), 650-663.
- Trafton, J. G., Altmann, E. M., Brock, D. P., & Mintz, F. E. (2003). Preparing to resume an interrupted task: Effects of prospective goal encoding and retrospective rehearsal. *International Journal of Human Computer Studies*. 58(5), 582-602. [NRL Alan Berman Award Winner]
- Swoboda, N. & Trafton, J. G. (2002). Conference Report: Diagrams 2002: Theory and Application of Diagrams. *Künstliche Intelligenz* [Artificial Intelligence]. 4/02, p. 45.
- Altmann, E. M. & Trafton, J. G. (2002). Memory for goals: An activation-based model. *Cognitive Science*. 26(1), 39-83.
- Trafton, J. G. & Trickett, S. B. (2001). Note-Taking for self-explanation and problem solving. *Human Computer Interaction*. 16(1), 1-38. [Lead Article]
- Trafton, J. G., Kirschenbaum, S. S., Tsui, T. L., Miyamoto, R. T., Ballas, J. A., & Raymond, P. D. (2000). Turning Pictures into Numbers: Extracting and Generating Information from Com-

- plex Visualizations. *International Journal of Human Computer Studies* 53 (5), 827-850.
- Lipps, A. W., Trafton, J. G., & Gray, W. D. (1998). Animation as documentation: A replication with reinterpretation. *Intercom*, 7, 199–201.
- Trafton, J. G. (1995). A hybrid model using neural networks and ACT-R. *Behavior Research Methods, Instruments, and Computers*, 27 (2), 183–186.
- Trafton, J. G. (1994). The contributions of studying examples and solving problems to skill acquisition. Ph.D thesis: Department of Psychology, Princeton University, Princeton, NJ.
- Merrill, D. C., Reiser, B. J., Ranney, M., & Trafton, J. G. (1992). Effective pedagogical strategies in human tutors and intelligent tutoring systems. *Journal of the Learning Sciences*, 2, 277–306.
- Klein, S. B., Loftus, J., Trafton, J. G., & Fuhrman, R. W. (1992). The use of exemplars and abstractions in trait judgments: A model of trait knowledge about the self and others. *Journal of Personality and Social Psychology*, 63, 739–753.

### **Journal Articles under review:**

- Monk, C. M., Trafton, J. G., & Boehm-Davis, D. A. (under review). Resumption of Suspended Goals: Evidence for an Activation-Based Theory of Interruption Recovery. *Journal of Experimental Psychology: Applied*.
- Ratwani, R. M., Trafton, J. G., & Boehm-Davis, D. A. (under review). Thinking Graphically.
- Schunn, C. D., Kirschenbaum, S. S., & Trafton, J. G. (under review). Sources of informational uncertainty *Human Factors*.
- Schunn, C. D., Kirschenbaum, S. S., & Trafton, J. G. (under review). Indicators and strategies for reducing informational uncertainty *International Journal of Human Computer Studies*.

## **Book Chapters:**

- Trickett, S. B., Trafton, J. G., Saner, L., & Schunn, C. D. (in press). “I don’t know what’s going on there”: The Use of Spatial Transformations to Deal With and Resolve Uncertainty in Complex Visualizations. To appear in M. Lovett & Shah, P. (Eds.), *Thinking with data*.
- Schunn, C. D., Saner, L. D., Kirschenbaum, S. K., Trafton, J. G., & Littleton, E. B. (in press). Complex visual data analysis, uncertainty, and representation. To appear in M. Lovett & Shah, P. (Eds.), *Thinking with data*.
- Trickett, S. B. & Trafton, J. G. (2006). Toward a comprehensive model of graph comprehension: Making the case for spatial cognition. (pp. 286-300). In D. Barker-Plummer, R. Cox, & N. Swoboda (Eds.). *Diagrammatic Representation and Inference*.
- Trafton, J. G., Schultz, A. C., Cassimatis, N. L., Hiatt, L. M., Perzanowski, D., P., Brock D. P., Bugajska M., & Adams W. (2006). Communicating and collaborating with robotic agents (pp. 252-278). In R. Sun (Ed.), *Cognition and Multi-Agent Interaction: From cognitive modeling to social simulation*.
- Trickett, S. B., Schunn, C. D., & Trafton, J. G. (2004). Puzzles and Peculiarities: How Scientists Attend to and Process Anomalies During Data Analysis (2004). In M. E. Gorman, A. Kincannon, D. Gooding, & R. D. Tweney (Eds.), *Spherical horses and shared toothbrushes: Recent developments in scientific and technological thinking*.
- Trickett, S. B. & Trafton, J. G. (2004). Spatial Transformations in graph comprehension. In A. F. Blackwell, K. Marriott, and A. Shimojima (Eds.). *Diagrammatic Representation and Inference*.
- Trafton, J. G., Marshall, S., Mintz, F., & Trickett, S. B. (2002). Extracting explicit and implicit information from complex visualizations (pp. 206-220). In M. Hegarty, B. Meyer, & H.

Narayanan (Eds.) *Diagrammatic Representation and Inference*.

Bogacz, S., & Trafton, J. G. (2002). Understanding static and dynamic images (pp. 247–249). In M. Hegarty, B. Meyer, & H. Narayanan (Eds.) *Diagrammatic Representation and Inference*.

Perzanowski, D., Schultz, A. C., Adams W., Bugajska M., Marsh, E., Trafton, J. G., Brock D., Skubic, M., & Abramson, M. (2002). Communicating with teams of cooperative robots (pp. 185–193). In A. C. Schultz and L. E. Parker (Eds.), *Multi-Robot Systems: From Swarms to Intelligent Automata*, Dordrecht, The Netherlands: Kluwer.

Brock, D. & Trafton, J. G. (1999). Cognitive representation of common ground in user interfaces. In Judy Kay (Ed.), *User Modeling*, New York, NY: Springer-Wien. 287-289.

#### **Conference Presentations, Papers, and Technical Reports:**

Kennedy, W. G., Bugajska, M., Marge, M., Adams, W., Fransen, B. R., Perzanowski, D., Schultz, A. C., Trafton, J. G. (under review). From hiding and seeking to covertly approaching.

Ratwani, R. M., & Trafton, J. G. (2006). Now, where was I? Examining the Perceptual Processes while Resuming an Interrupted Task. *The proceedings of the twenty-eighth annual conference of the cognitive science society*.

Ratwani, R. M., & Trafton, J. G. (2006). Helpful or harmful? Examining the effects of interruptions on task performance. *Proceedings of the Human Factors and Ergonomics Society 50th Annual Meeting*.

Cades, D. M., Trafton, J. G., & Boehm-Davis, D. A. (2006). Mitigating Disruptions: Can Resuming an Interrupted Task Be Trained? *Proceedings of the Human Factors and Ergonomics Society 50th Annual Meeting*.

Kennedy, W. G., Trafton, J. G. (2006). Long-term symbolic learning in Soar and ACT-R. International Conference for Cognitive Modeling, 2006.

- Trafton, J. G., Schultz, A. C., Perzanowski, D., Bugajska, M. D., Adams, W., Cassimatis, N. L., & Brock, D. P. (2006). Children and robots learning to play hide and seek. *Human Robot Interaction*.
- Squire, P., Trafton, J. G., Parasuraman, R. (2006). Human Control of Multiple Unmanned Vehicles: Effects of Interface Type on Execution and Task Switching Times. *Human Robot Interaction*.
- Trafton, J. G., Schultz, A. C., Bugajska, M., Mintz, F. E. (2005). Perspective-taking with robots: Experiments and models. *Proceedings of the 14th IEEE International Workshop on Robot and Human Interactive Communication*.
- Fong, T., Nourbakhsh, I., Kunz, C., Fluckiger, L., Schreiner, J., Ambrose, R., Burridge, R., Simmons, R., Hiatt, L.M., Schultz, A., Trafton, J. G., Bugajska, M., & Scholtz, J. (2005). The Peer-to-Peer Human-Robot Interaction Project. *Proceedings of AIAA Space 2005, AIAA-2005-6750*.
- Trafton, J. G., Altmann, E. M., & Brock, D. P. (2005). The long-term disruption effect: A comparison of three memory models. *The proceedings of the 2005 ACT-R conference*.
- Trafton, J. G., Altmann, E. M., & Brock, D. P. (2005). Huh, what was I doing? How people use environmental cues after an interruption. *Proceedings of the Human Factors and Ergonomics Society 49th Annual Meeting*.
- Ratwani, R. M., & Trafton, J. G. (2005). Shedding Light on the Graph Schema. *The proceedings of the twenty-seventh annual conference of the cognitive science society*.
- Trickett, S. B., & Trafton, J. G. (2005). Representation Matters: The Effect of Graph Selection on Data Interpretation Among Experts and Novices. *The proceedings of the twenty-seventh annual conference of the cognitive science society*.
- Trafton, J. G. (2004). Uncertainty and Spatial Transformations in Complex Visualizations. NATO workshop on Visualisation and the Common Operational Picture (VizCOP).

- Trafton, J. G. (2004). Dynamic Mental Models in weather forecasting. *Proceedings of the Human Factors and Ergonomics Society 48th Annual Meeting*.
- Ratwani, R. M., Trafton, J. G., & Boehm-Davis, D. A. (2004). From Specific Information Extraction to Inferences: A Preliminary Framework of Graph Comprehension. *Proceedings of the Human Factors and Ergonomics Society 48th Annual Meeting*.
- Mintz, F. E., Trafton, J. G., Marsh, E., & Perzanowski, D. (2004). Choosing frames of reference. *Proceedings of the Human Factors and Ergonomics Society 48th Annual Meeting*.
- Trafton, J. G., Hegarty, M., Tversky, B., Schunn, C. D., Cassell, J., & Alibali, M. (2004). The relationship between spatial cognition and gestures. *The proceedings of the twenty-fourth annual conference of the cognitive science society*.
- Altmann, E. M., & Trafton, J. G. (2004). Task interruption: Disruptive effects and the role of cues. *The proceedings of the twenty-sixth annual conference of the cognitive science society*.
- Ratwani, R. M., & Trafton, J. G. (2004). Making Graphical Inferences: A Hierarchical Framework. *The proceedings of the twenty-sixth annual conference of the cognitive science society*.
- Trickett, S. B., & Trafton, J. G. (2004). Use of Spatial Transformations in Graph Comprehension. *The proceedings of the twenty-sixth annual conference of the cognitive science society*.
- Ratwani, R. M., Trafton, J. G., & Boehm-Davis, D. A. (2004). Making inferences from graphs. Division 21/19 Mid Year meeting. [Best Student Paper Award.]
- Sofge, D. Trafton, J. G., Cassimatis, N., Perzanowski, D., Bugajska, M. D., Adams, W., & Schultz, A. (2004). Human-Robot Collaboration and Cognition with an Autonomous Mobile Robot. *Proceedings of the 8th Conference on Intelligent Autonomous System*.
- Trickett, S. B., Watkins, T. E., & Trafton, J. G. (2003). How Novices Reason about Anomalies. *The proceedings of the*

*twenty-fifth annual conference of the cognitive science society.*

- Ratwani, R. M., Trafton, J. G., & Boehm-Davis, D. A. (2003). Thinking Graphically: Extracting local and global information. *The proceedings of the twenty-fifth annual conference of the cognitive science society*.
- Trafton, J. G., Schultz, A., Perzanowski, D., Adams, W., Bugajska, M. D., Cassimatis, N., & Brock, D. P. (2003). Children and robots learning to play hide and seek. IJCAI 2003 workshop on Cognitive modeling of agents and multi-agent interaction.
- Trafton, J. G., Altmann, E. M., & Brock, D. P. (2003). The Disruptiveness of Interruptions. *Proceedings of the tenth annual ACT-R workshop*.
- Trafton, J. G., Mintz, F. E., & Ballas, J. A. (2003). Navy forecasters' use of multiple data source on land and at sea. Naturalistic Decision Making.
- Trafton, J. G., Schultz, A., Adams, W., Cassimatis, N. (2003). Playing hide and seek: How much spatial cognition is needed? Proceedings of the International Conference on Cognitive Modeling.
- Monk, C. M., Boehm-Davis, D. A., & Trafton, J. G. (2002). The attentional costs of interrupting task performance at various stages. *Proceedings of the Human Factors and Ergonomics Society 46th Annual Meeting*.
- Trafton, J. G., Shah, P., Freedman, E. G., Kirschenbaum, S., Cheng, P. C-H., & Hegarty, M. (2002). The cognition of complex visualizations. *The proceedings of the twenty-fourth annual conference of the cognitive science society*.
- Trickett, S. B. & Trafton, J. G. (2002). The Instantiation and Use of Conceptual Simulations in Evaluating Hypotheses: Movies-in-the-Mind in Scientific Reasoning. *The proceedings of the twenty-fourth annual conference of the cognitive science society*.

- Jones, D. W., Ballas, J. A., Miyamoto, R. T., Tsui, T., Trafton, J. G., & Kirschenbaum, S. S. (2002). Human systems study on the use of meteorology and oceanogrphy informaiton in support of the naval air strike mission (Technical Memorandum No. APL-UW TM 8-02). Seattle, WA: Applied Physics Laboratory, University of Washington.
- Cassimatis, N. L., Trafton, J. G., Schultz, A. C., Bugajska, M. D., & Adams, W. (2002). A Task Domain for Combining and Evaluating Robotics and Cognitive Modeling Techniques. PERMIS 02.
- Cassimatis, N. L., & Trafton, J. G. (2002). An Architecture for Human-Robot Interaction Based on Perspective Taking. AAAI Fall Symposium 2002.
- Bugajska, M. D., Schultz, A. C., Trafton, J. G., Taylor, M., & Mintz, F. (2002). Hybrid Cognitive-Reactive Multi-Agent Controller. IROS 2002.
- Bugajska, M. D., Schultz, A. C., Trafton, J. G., Gittens, S., & Mintz, F. (2001). Building adaptive computer generated forces: The effect of increasing task reactivity on human and machine control abilities. GECCO01.
- Trafton, J. G. (2001). Spatial Transformations. Invited presentation at the Psychology Department of Mississippi State University. Mississippi State, MS.
- Trafton, J. G. (2000). Turning Pictures into Numbers: The use of Complex Visualizations. Invited presentation at Engineering Research Council of Mississippi State University. Mississippi State, MS.
- Trafton, J. G., Trickett, S. B., & Mintz, F. (2001). Overlaying Images: Spatial Transformations of Complex Visualizations. Model Based Reasoning '01.
- Trafton, J. G., & Trickett, S. B. (2001). A new model of graph and visualization usage (pp. 1048-1053). *The proceedings of the twenty-third annual conference of the cognitive science society*

- Trickett, S. B., Trafton, J. G., Schunn, C. D., & Harrison, A. (2001). "That's Odd!" How Scientists Respond to Anomalous Data. *The proceedings of the twenty-third annual conference of the cognitive science society*
- Trafton, J. G., Schultz, A. C., Bugajska, M. D., Gittens, S., & Mintz, F. E. (2001). An Investigation of How Humans and Machines Deal with Increases in Reactivity. *The 10th Conference on Computer Generated Forces and Behavioral Representation*.
- Lanzagorta, M. O., Rosenberg, R., & Trafton, J. G. (2001). Cognitive processes in scientific visualization. *The proceedings of the International Society for Optical Engineering 2001*.
- Trafton, J. G. (2001). Spatial Transformations. Invited presentation at the Psychology Department of George Mason University. Fairfax, VA.
- Trafton, J. G. (2000). Predicting Complex Information Using Qualitative Mental Models. *Human Performance, Situation Awareness, and Automation: User-Centered Design for the New Millennium*, 18–19.
- Schultz, A. C., & Trafton, J. G. (2000). A Hybrid Cognitive and Reactive Architecture. Presented at AAAI.
- Trickett, S. B., Fu, W., Schunn, C. D., & Trafton, J. G. (2000). From Dipsy-Doodles to Streaming-Motions: Changes in Representation in the Analysis of Visual Scientific Data. *The proceedings of the twenty-second annual conference of the cognitive science society*.
- Trickett, S. B., Trafton, J. G., & Schunn, C. D. (2000). Blobs, Dipsy-Doodles and Other Funky Things: Framework Anomalies in Exploratory Data Analysis. *The proceedings of the twenty-second annual conference of the cognitive science society*.
- Altmann, E. M. & Trafton, J. G. (2000). Prospective memory: Proactive, reactive, or both? Invited presentation at NASA.

- Trafton, J. G. (2000). Using Usability. Presented at the Distributed Autonomous Systems Workshop, Naval Research Laboratory. Washington, DC.
- Trafton, J. G. (2000). Turning Pictures into Numbers: The use of Complex Visualizations. Invited presentation at the Psychology Department of George Mason University. Fairfax, VA.
- Schunn, C. D., Trickett, S. B., & Trafton, J. G. (1999). What gestures reveal about the scientist's mind: Data Analyses of Data Analyses. Use of Gestures in Scientific Discovery. Invited Presentation at the Krasnow Institute of George Mason University. Fairfax, VA.
- Schunn, C. D., Trickett, S. B., Trafton, J. G., & Seeley, G. (1999). Sifting through Masses of Observational Data: Children and Professional Astronomers. Invited symposium talk presented at the 1st Meeting of the Cognitive Development Society. Chapel Hill, NC.
- Trafton, J. G. (1999). Spatial Transformations. Invited Presentation at the ONR Workshop on Sonar Visualizations (core presenter). NUWC, RI.
- Trafton, J. G. (1999). What's in a goal? Panel organizer. *Proceedings of the 6th annual ACT-R workshop*.
- Altmann, E. M. & Trafton, J. G. (1999). Functional encoding in memory for goals. *Proceedings of the 6th annual ACT-R workshop*.
- Altmann, E. M. & Trafton, J. G. (1999). Memory for goals: An architectural perspective. *The proceedings of the twenty-first annual conference of the cognitive science society*.
- Miller, S. L., & Trafton, J. G. (1999). Natural language and direct manipulation search tools in a multimodal information system. *Proceedings of ACM CHI'99 Conference on Human Factors in Computing Systems*.
- Miller, S. L., & Trafton, J. G. (1999). Improving information search using natural language and direct manipulation tools in a multimodal interface. *HFES 43rd Annual Meeting*.

- Trickett, S. B. & Trafton, J. G. (1999). Note-taking as a strategy for learning (pp. 742-748). *The proceedings of the twenty-first annual conference of the cognitive science society*.
- Trickett, S. B. & Trafton, J. G. (1999). Learning and transfer of systematicity. *Poster presented at the twenty-first annual conference of the cognitive science society*.
- Trickett, S. B., Trafton, J. G., & Raymond, P. D. (1998). Exploration in the experiment space: The relationship between systematicity and performance (pp. 1067-1072). *The proceedings of the twentieth annual conference of the cognitive science society*.
- Lipps, A. W., Katz, I., R., & Trafton, J. G. (1998). Factors affecting difficulty of generate and test in algebra problem solving. *Virginia Academy of Science*.
- Lipps, A. W., Katz, I., R., & Trafton, J. G. (1998). Role of solution space in generating examples problems. *Psychonomic Society*.
- Lipps, A. W., Trafton, J. G., & Gray, W. D. (1998). Animation as documentation: A replication with reinterpretation. *The 1998 Society for Technical Communication*.
- Trafton, J. G., Wauchope, K., Raymond, P. D., Deubner, B., Stroup, J., & Marsh, E. (1997). How natural is natural language for Intelligent Tutoring Systems? *The proceedings of the nineteenth annual conference of the cognitive science society*.
- Trafton, J. G., Wauchope, K., & Stroup, J. (1997). Errors and usability of natural language in a multimodal system. *The proceedings of the 15th International Joint Conference on Artificial Intelligence (IJCAI-97)*.
- Trafton, J. G. (1996). Alphabet Arithmetic and ACT-R: A reply to Rabinowitz and Goldberg. *The proceedings of the eighteenth annual conference of the cognitive science society*.
- Brock, D. & Trafton, J. G. (1996). A preliminary architecture for the implementation of task model tracing. *Third Annual ACT-R Workshop Proceedings*.

- Airth, M. E. & Trafton, J. G. (1996). An evaluative assessment of APPEX. Naval Research Laboratory.
- Brock, D., Hix, D., Dievendorf, L., & Trafton, J. G. (1995). Extending the user action notation for research in individual differences. *Proceedings of the Human Factors and Ergonomics Society 39th Annual Meeting*.
- Sandoval, W. A., Trafton, J. G., & Reiser, B. J. (1995). The Effects of Self-Explanation on Studying Examples and Solving Problems. *The proceedings of the seventeenth annual conference of the cognitive science society*.
- Trafton, J. G. (1995). DACSF: A methodology for creating synthetic tasks. Technical Report: AL/CF-TR-1995-0020. Brooks Air Force Base.
- O'Donnell, B., Eddy, D., Cardenas, B., Trafton, J. G., & Campbell, J. (1995). Development of the situation awareness flight training and simulation evaluation (SAFTE) system: Definition of situation awareness measures and initial development of the flight simulator. Technical Report: AL/CF-TR-1995-0039. Brooks Air Force Base.
- Trafton, J. G. (1994). Studying Examples and Solving Problems: A comparison of two models Rice University, Houston, TX.
- Trafton, J. G. (1994). A hybrid model using neural networks and ACT-R. Annual meeting of the Society for Computers in Psychology.
- Reiser, B. J., Merrill, D., Neel, K., Ranney, M., & Trafton, J. G. (1994). Reasoning—Congruent Learning Environments and Explanatory Guidance: Theory and Results of the GIL Tutoring Project. *Annual Meeting of the American Educational Research Association*.
- Trafton, J. G., & Reiser, B. J. (1993). The contributions of studying examples and solving problems to skill acquisition. *The proceedings of the fifteenth annual conference of the cognitive science society* (pp. 1017–1022). Hillsdale, NJ: Erlbaum.

- Trafton, J. G. (1992). The Role of Examples in Learning. Educational Testing Service, Princeton, NJ
- Reiser, B. J., Beekelaar, R., Hamid, A., Handleman, E., Wurmser, C., Tyle, A., Bednarsh, A., Ranney, M., Merrill, D., & Trafton, J. G. (1992). GIL: Scaffolding Learning to Program with Reasoning-Congruent Representations and Model Tracing Guidance. *Intelligent Tutoring Systems: Second International Conference, ITS '92*.
- Merrill, D. C., Reiser, B. J., Ranney, M., & Trafton, J. G. (1991). Effective pedagogical techniques in human tutors and intelligent tutoring systems. Technical Report No. 51, Cognitive Science Laboratory, Princeton University, Princeton, NJ.
- Trafton, J. G., & Reiser, B. J. (1991). Providing natural representations to facilitate novices' understanding in a new domain: Forward and backward reasoning in programming. *The proceedings of the thirteenth annual conference of the cognitive science society* (pp. 923–927). Hillsdale, NJ: Erlbaum.